DETAILED ACTION

1. The papers submitted on 02 December 2010, amending claims 1-4 and canceling claim 5, are acknowledged.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1, 6, 10, 12 and 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Shiina (EP 0 698 464 A2) in view of Abe et al. (Study on Foaming of Crosslinked Polyethylene) and Almanza et al. (The microestructure of polyethylene foams produced by a nitrogen solution process).

6. Regarding claim 1, Shiina discloses a process for producing a foam composite having a skin with an even thickness and an integrated foamed body core, wherein the skin and the core are bonded together **(title/abstract)** with the steps of: charging a mold with a minute plastic powders/particles and polyolefin pellets that can be cross-linked and foamed, the pellets having 0.2 PHR to 0.5 PHR of dicumyl peroxide as a cross-linking agent and from 1.5 PHR to 20 PHR of azodicarbon amide as a foaming agent, wherein the pellets are larger than the powder/particles; heating the mold from the outside of the mold; rotating the mold at 1 to 2 rpm, thereby forming a plastic skin to which the pellets adhere; and further heating the mold so that the polyolefin cross-links and the pellets expand by the decomposition of a foaming agent **(14:16-23:15, Examples 1-11)**.

7. Shiina does not appear to explicitly discloses crosslinking to a degree of storage elastic modulus within a range from 1.6×10^4 to 3.0×10^4 Pa at 190° C and 100Hz.

8. However, Abe discloses a crosslinked polyolefin foam **(see abstract)** which exhibits decreasing storage modulus (G') with decreasing frequency measurement. Additionally, Abe discloses decreasing storage modulus with decreasing cross-linking density, i.e. level crosslinking degree **(see p. 2151 col. 1 and Fig. 5)**. Further, the storage modulus of Abe is measure at 438 K (164.85 degrees Celsius).

9. Additionally, Almanza discloses a crosslinked polyolefin foam **(see abstract)** wherein that measurements of the storage modulus decreases with increasing temperature **(see pp. 7124-7125 and FIG. 10(a) and 10(b))**.

10. Therefore, at the time of invention, it would have been prima facie obvious to one of ordinary skill in the art to measure the foam of Shiina at a modulus within the claimed range by measuring at a low frequency and high temperature. Furthermore, the storage modulus could be readily modified/optimized by increasing or decreasing the cross-linking density, i.e. by increasing or decreasing the amount of cross-linking agent, as further discussed in Abe. Finally, the specific claimed shear storage elastic modulus measured at 190° C. and 100 Hz would be an inherent property obtain without undue experimentation from the method of Shiina. "[T]he discovery of a previously unappreciated property of a prior art composition, or of a scientific explanation for the prior art's functioning, does not render the old composition patentably new to the discoverer." Atlas Powder Co. v. Ireco Inc., 190 F.3d 1342, 1347, 51 USPQ2d 1943, 1947 (Fed. Cir. 1999). Thus the claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). **(see further MPEP 2112)**.

11. Regarding claim 6, Shiina discloses that the powder contains 1 PHR azodicarbon amide, a foaming agent **(see col. 22 ll. 44-45)**.

12. Regarding claim 10 , Shiina discloses that the wherein the plastic powders is high density polyethylene **(see col. 22 ll. 46)**.

13. Regarding claim 12, Shiina discloses adding a flame retardant **(see col. 11 ll. 8-15)**.

14. Regarding claim 14, Shiina discloses the powder is HDPE and contains 2 PHR organic peroxide **(see col. 18 ll. 13-14)**.

15. Alternatively claims 1, 6, 10, 12 and 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Shiina et al. (EP 0 698 464 A2) in view of Shiina et al. (JP 2002-192548 A).

16. Regarding claim 1, Shiina discloses a process for producing a foam composite having a skin with an even thickness and an integrated foamed body core, wherein the skin and the core are bonded together **(title/abstract)** with the steps of: charging a mold with a minute plastic powders/particles and polyolefin pellets that can be cross-linked and foamed, the pellets having 0.2 PHR to 0.5 PHR of dicumyl peroxide as a cross-linking agent and from 1.5 PHR to 20 PHR of azodicarbon amide as a foaming agent, wherein the pellets are larger than the powder/particles; heating the mold from the outside of the mold; rotating the mold at 1 to 2 rpm, thereby forming a plastic skin to which the pellets adhere; and further heating the mold so that the polyolefin cross-links and the pellets expand by the decomposition of a foaming agent **(14:16-23:15, Examples 1-11)**.

17. Shiina (EP 0 698 464 A2) does not appear to explicitly discloses crosslinking to a degree of storage elastic modulus within a range from 1.6×10^4 to 3.0×10^4 Pa at 190° C. and 100 Hz.

18. However, Shiina (JP 2002-192548 A) discloses a similar process as disclosed above **(see title/abstract)** wherein a polyolefin material having a storage modulus of greater than 1×10^4 Pa and less than 1×10^5 Pa **(see ¶ 10, 11, 40)**.

19. At the time of invention, it would have been prima facie obvious to one of ordinary skill in the art to modify the storage modulus of Shiina (EP 0 698 464 A2) to include the modulus of

Shiina (JP 2002-192548 A), because such properties are desirable in the final product and could be combined in a known method to yield predictable results. Further, the specific claimed shear storage elastic modulus measured at 190° C. and 100 Hz would be an obvious physical property obtain without undue experimentation from the method of Shiina. "[T]he discovery of a previously unappreciated property of a prior art composition, or of a scientific explanation for the prior art's functioning, does not render the old composition patentably new to the discoverer." Atlas Powder Co. v. Ireco Inc., 190 F.3d 1342, 1347, 51 USPQ2d 1943, 1947 (Fed. Cir. 1999). Thus the claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). **(see further MPEP 2112)**.

20. Regarding claim 6, Shiina discloses that the powder contains 1 PHR azodicarbon amide, a foaming agent **(see col. 22 ll. 44-45)**.

21. Regarding claim 10 , Shiina discloses that the wherein the plastic powders is high density polyethylene **(see col. 22 ll. 46)**.

22. Regarding claim 12, Shiina discloses adding a flame retardant **(see col. 11 ll. 8-15)**.

23. Regarding claim 14, Shiina discloses the powder is HDPE and contains 2 PHR organic peroxide **(see col. 18 ll. 13-14)**.

24. Claims 2-4, 7-9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiina et al. (EP 0 698 464) in view of in view of Shiina et al. (US 3,987,134).

25. Regarding claim 2-4, Shiina a process for producing a foam composite having a skin with an even thickness, a foamed body with homogeneous and fine bubbles, and plastic reinforcing

members **(title/abstract)** with the steps of: charging a mold with minute plastic powders/particles and polyolefin pellets that are larger than the powders/particles, wherein the polyolefin pellets are covered in a portion or in the whole surface with plastic **(9:4-15)** and are cross-linked and foamed; heating the mold from the outside of the mold; rotating the mold at 1 to 2 rpm, so that a plastic skin is formed and the pellets adhere to the skin; and further heating the mold, to permit the polyolefin to cross-link and the pellets to expand by the decomposition of a foaming agent (**14:16-23:15, Examples 1-11**), wherein a skin thickness of 0.5 to 10 mm **(see col. 7 ll. 38-40)**, a foam density of 0.1 to 0.01 g/cc **(see col. 9 l. 46 and col. 14 l. 47)** a molded article thickness, i.e. diameter, of 1 to 100 mm **(see col. 7 ll. 6-7)**. Additionally, Shiina discloses that the polyolefin pellets are formed as a rod of polyolefin which is covered with plastic, compressed and cut **(see col. 9 ll. 4-15)**; and when foaming the pellets form even size granular foamed bodies with a covering of a reinforcing member with practically even thickness and are integrated, bonded mutually, filling in the core, and bonded to the skin **(see col. 22 l. 56 to col. 23 l. 15)**.

26. Shiina et al. (EP 0 698 464 A2) does not appear to expressly disclose that the edge section are bonded or the shape of the reinforcing members.

27. However, Shiina et al. (US 3,987,134) discloses a method of producing foamed articles in substantially the same manner as Shiina et al. (EP 0 698 464 A2), wherein the compression cutting seals the internal material **(see col. 3 ll. 62-68)**. Further Shiina et al. (US 3,987,134) discloses belt, string and solid shaped reinforcements intermingled with the foamed bodies **(see fig. 5-8)**.

28. At the time of invention, it would have been prima facie obvious to one of ordinary skill in the art to modify the method of Shiina et al. (EP 0 698 464 A2) to include the sealing of Shiina

et al. (US 3,987,134), because this would allow for the formation of desirable shaped continuous internal reinforcements having reinforcement structure thickness of 0.3 to 10 mm as disclosed by Shiina (US 3,987,134) **(see col. 3 ll. 34-36)**..

29. Regarding claim 7, Shiina (US 3,987,134) discloses that the plastic covering, i.e. the reinforcement forming portion, of the polyolefin pellets contains a foaming agent in an amount of 2 PHR **(see col. 4 ll. 40-44 and col. 8 l. 63 to col. 9 l. 30)**.

30. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiina et al. (EP 0 698 464 A2) in view of Shiina et al. (US 3,987,134) as applied to claim 2 above, further in view of Lammers (US 3,773,875)

31. Shiina does not appear to expressly disclose forming the foam to contain metal fittings strongly secured to the reinforcing members.

32. However, Lammers discloses a method of forming a foamed article **(see title/abstract)** in which metal fittings are embedded into the foamed body **(see abstract and col. 1 l. 71 to col. 2 l. 43)**

33. At the time of invention, it would have been prima facie obvious to one of ordinary skill in the art to modify the method of Shiina to include the metal fittings of Lammers, in order to allow for attachment means to be embedded securely within the foam article.

Response to Arguments

34. Applicant's arguments with respect to the 35 U.S.C. § 102(b) rejection(s) of claim 2, 8, 9 and 11 have been considered but are moot in view of the new ground(s) of rejection.

35. Applicant's arguments with respect to the 35 U.S.C. § 103(a) rejection(s) claims 1, 6, 10, 12-14 have been considered but are moot in view of the new ground(s) of rejection. Specifically, the newly cited portions of Shiina which teach the claimed cross-linking and foaming agent concentration. And further because applicant does not present a reasoned argument against the rejection(s), merely presenting a conclusory statement that the claim is not rendered obvious by the cited documents.

36. Applicant's arguments with respect to the 35 U.S.C. § 103(a) rejection(s) of claims 3-5 and 7, have been fully considered and are not persuasive. Applicant argues that the article thickness of Shiina US is not the thickness of the foamed body but instead is the thickness of the foam composite. This is not convincing for two reasons. First, the Shiina EP teaches the thickness of the foamed body, not Shiina US. Second, the instant claim/specification does not present a clear difference between the thickness of a foamed body and the thickness of a foam composite, therefore the limitation "thickness of the foamed body" as the thickness of entire foamed article.

Conclusion

37. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

38. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

39. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BENJAMIN SCHIFFMAN whose telephone number is (571) 270-7626. The examiner can normally be reached on Monday through Thursday from 9AM until 4PM.

40. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, CHRISTINA JOHNSON can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

41. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BENJAMIN SCHIFFMAN/

Examiner, Art Unit 1742

/Christina Johnson/
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